

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-n are rejected under 35 U.S.C. 102(b) as being anticipated by Uemura (US 6,310,364).

With regard to claims 1 and 20, Uemura discloses a light-emitting apparatus (col. 4, line 16 et seq. and fig. 1), comprising:

- A semiconductor light-emitting element 20 including a substrate 21 (col. 7, Table 1), where light radiates from a light emission surface of the substrate 21 of the light-emitting element 20, the light emission surface being provided on the substrate 21 opposite to an electrode forming surface of the light-emitting element 20 (fig. 1);
- An inorganic transparent structure 10 (col. 4, lines 24-28), mounted on the light emission surface of the substrate 21 (fig. 1), where the transparent structure 10 is optically connected with the entire light emission surface, has a light distribution characteristic based on a three-dimensional shape of the transparent structure (col. 4, lines 28-32), comprises a side surface through which light radiated from the light emission surface is discharged from the transparent structure 10 (fig. 1), and

is bonded to the substrate 21 by a transparent adhesive layer 30 (col. 5, lines 43-44).

With regard to claim 3, Uemura discloses the transparent structure 10 has a thickness of half that of the semiconductor light-emitting element 20 to twice the length of a shorter side of the semiconductor light-emitting element 20 (col. 4, lines 24-38).

With regard to claim 6, Uemura discloses one of the lead frames has a cup portion 52 (fig. 1) and the transparent structure is fixed on the cup 52 through adhesive resin 60 with light diffusion material 201 mixed in (fig. 7).

With regard to claim 7, Uemura discloses the electrodes do not transmit light (col. 5, lines 3-7).

With regard to claims 8 and 16-18, in addition to the limitations disclosed in claim 1 above, Uemura also discloses:

- Lead frames 50 that are electrically connected to electrodes 26 and 27 formed on the electrode forming surface through wires 40 (fig. 1);
- Light transmitting resin 60 that seals the semiconductor light-emitting element 20 and the transparent structure 10 (fig. 1), the light transmitting resin 60 comprising a phosphor (fluorescent) to wavelength-convert the light emitted from the semiconductor light-emitting element 20 (col. 8, lines 1-11).

With regard to claim 9, Uemura discloses the light transmitting resin comprises two or more phosphors (col. 8, lines 24-26).

With regard to claims 10-11, Uemura discloses the gallium nitride semiconductor light-emitting element 20 comprises a substrate 21, a buffer layer 22, an n-type semiconductor layer 23, a light-emitting layer 24, and a p-type semiconductor layer 25 (col. 7, Table 1).

With regard to claim 12, Uemura discloses the transparent structure 10 comprises a light transmitting material such as SiO₂, sapphire, and glass (col. 4, line 27).

With regard to claim Uemura discloses the substrate 21 is sapphire (col. 4, line 65).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uemura (US 6,310,364) in view of Lin et al. (US 6,603,151).

With regard to claim 4, Uemura does not disclose the transparent structure 10 has a microscopic uneven surface to diffuse light. However, Lin et al. disclose a layer 217 to diffuse light (fig. 6a). Lin et al. teach the patterned grating layer 217 can prevent the light reflected from going back to the active layer of the light-emitting structure (Lin col. 5, lines 1-5). Therefore, it would have been obvious to one of ordinary skill in the art to modify Uemura's device with the teaching of Lin et al. to provide a microscopic uneven surface to prevent the light reflected from going back to the active layer of the light-emitting structure.

With regard to claim 5, Uemura modified by Lin et al. disclose the transparent structure has a reflection layer 217 formed on its surface (col. 5, line 1).

With regard to claims 21-23, Uemura discloses the transparent structure is not particularly limited in shape (col. 4, lines 28-29) and the transparent structure 10 could have a trapezoids-shape, which comprises an inclined plane.

Response to Arguments

Applicant's arguments with respect to claims 1 and 3-23 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is 571-272-1709. The examiner can normally be reached on 7:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wai-Sing Louie/
Primary Examiner, Art Unit 2814

Wsl
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